

CLAIMS

The invention claimed is:

1. A method of scrambling a digital image comprising the steps of:
 - 5 (a) transforming a value of pixels of said image to an array of transform coefficients; and
 - (b) selectively transposing at least one transform coefficient of at least two said arrays, said at least two arrays arranged along an axis substantially orthogonal to an axis of packetization of said transform coefficients.
- 10 2. The method of claim 1 wherein said transposed transform coefficients occupy corresponding positions in said at least two arrays.
- 15 3. The method of claim 1 wherein said transformed value of said image pixels is a luminance of said pixels.
4. The method of claim 1 wherein said transformed value of said image pixels is a chrominance of said pixels.
- 20 5. The method of claim 1 further comprising the step of altering a value of a transposed transform coefficient.
6. The method of claim 1 further comprising the step of altering a sign of a transposed transform coefficient if a value of said transform coefficient has a predefined relationship to a threshold value.
- 25 7. The method of claim 1 further comprising the step of selectively transposing at least one transform coefficient of at least two said arrays along an axis substantially parallel to an axis of packetization of said transform coefficients.
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8. A method of scrambling a digital image comprising the steps of:
- (a) mapping a plurality of pixels of said image to a pixel block;
 - (b) transforming a value of said pixels of said pixel block to an array of transform coefficients; and
 - 5 (c) selectively transposing a transform coefficient of at least two said arrays of transform coefficients arranged along an axis substantially orthogonal to an axis of packetization of said array.
- 10 9. The method of claim 8 wherein said transposed transform coefficients occupy corresponding positions in said at least two arrays.
10. The method of claim 8 wherein a luminance value of said pixels is transformed to said array of transform coefficients.
- 15 11. The method of claim 8 wherein a chrominance value of said pixels is transformed to said array of transform coefficients.
12. The method of claim 8 further comprising the step of altering a value of said transposed transform coefficients.
- 20 13. The method of claim 8 further comprising the step of altering a sign of a transposed transform coefficient if a value of said transform coefficient has a predefined relationship to a threshold value.
- 25 14. The method of claim 8 further comprising the step of selectively transposing at least one transform coefficient of at least two said arrays along an axis substantially parallel to an axis of packetization of said transform coefficients.
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15. A method of scrambling a sequence of digital images comprising the steps of:
- (a) selecting at least one said image for coding as a discrete image;
 - (b) transforming pixels of said discrete image to a plurality of arrays of transform coefficients;
 - 5 (c) selecting a plurality of said arrays arranged substantially along a first axis of said image;
 - (d) replacing a coefficient of a first of said selected arrays with a coefficient of a second of said selected arrays, said coefficients of said first and said second arrays being identified by a cryptographic
 - 10 key; and
 - (e) packetizing said coefficients of said plurality of arrays substantially along a second axis substantially orthogonal to said first axis.
16. The method of claim 15 wherein said coefficient of said second selected array occupies a same position in said second selected array as said replaced coefficient occupies in said first selected array.
17. The method of claim 15 wherein a luminance representation of said pixels is transformed to said array of transform coefficients.
- 20 18. The method of claim 15 wherein a chrominance representation of said pixels is transformed to said array of transform coefficients.
19. The method of claim 15 further comprising the step of altering a value of
- 25 coefficient of said second of said selected arrays.
20. The method of claim 15 wherein said selected plurality of arrays arranged substantially along a first axis of said image includes a first and a second pluralities of said arrays, said first and said second pluralities aligned with
- 30 said first axis but displaced from each other along said second axis.

21. The method of claim 15 further comprising the steps of:

- (a) selecting at least one image for prediction from said discrete image;
- (b) determining a difference between said predicted image and said discrete image;
- 5 (c) transforming pixels of said difference to a plurality of arrays of transform coefficients;
- (d) selecting a plurality said arrays arranged substantially along a first axis of said image;
- (e) replacing a coefficient of a first of said selected arrays with a
10 coefficient of a second of said selected arrays, said coefficients of said first and said second arrays being identified by a cryptographic key; and
- (f) packetizing said coefficients of said plurality of arrays substantially along a second axis substantially orthogonal to said first axis.

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22. An image encoder comprising:

- (a) a transform module to transform a plurality of image pixels to an array of transform coefficients;
- (b) a scrambling buffer storing a first array and a second array of
20 transform coefficients, said first and said second arrays representing portions of said image pixels arrayed along an axis substantially orthogonal to an axis of packetization of said transform coefficients;
- (c) a scrambler selectively transposing a coefficient of said first array to said second array; and
- 25 (d) a scrambling key identifying a coefficient of said first array for selective transposition to said second array by said scrambler.

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23. A decoder for a digital image comprising:

- (a) a scrambling key identifying a scrambling coefficient of a first array of

transform coefficients for selective transposition to a second array of transform coefficients;

(b) a descrambling buffer storing said first and said second arrays of transform coefficients, said first and said second transform coefficient arrays representing pixels of said digital image arrayed along an axis substantially orthogonal to an axis of packetization of said transform coefficients;

(c) a descrambler to selectively transpose said scrambling coefficient of said first array to said second array of coefficients as described by said scrambling key; and

(d) an inverse transform module to transform said array of said transform coefficients to a plurality of pixels of said digital image.

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